METHOD AND APPARATUS FOR RENDERING SHADOWS

ABSTRACT OF THE DISCLOSURE

A method and apparatus for rendering shadows. A pre-rendering process implements a two dimensional array or map of depth-based functions, such as a visibility function in z. During rendering of an object scene, these functions are accessed via lookup operations to efficiently determine the function value for a sample point at a given depth. The use of visibility functions allows for partial light attenuation effects. Each visibility function is computed by filtering multiple transmittance functions obtained by casting sample rays from a light source onto an object scene. The visibility function is implemented as a sequence of vertices. Colored shadows are modeled by vertices comprising a depth value and separate visibility function values for red, green, and blue light at a given depth value. Compression is achieved by minimizing the number of vertices needed to represent a visibility function within a desired error tolerance.